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HOUSEHOLD CALENDAR

What are Vitamin Units?

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A dialogue between Miss Ruth Van Deman, Bureau of Home Economics, and Dr. E. M. Nelson, Food and Drug Administration, delivered in the Department of Agriculture period of the National Farm and Home Hour, broadcast by a network of 48 associate NBC stations, Tuesday, February 16, 1937.

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ANNOUNCER: Resuming the National Farm and Home Hour from Washington, we present an ever popular feature with our women listeners, Miss Ruth Van Deman's Homemakers Calendar. Miss Van Deman.

MISS VAN DEMAN: Thank you, It isn't often that we have the honor of being announced by you. And we're also honored today in having as our guest on the Household Calendar Dr. E. M. Nelson of the Food and Drug Administration.

The other day I had a letter from a listener out in Laramie, Wyoming. She asked me so many questions about vitamin units and cod-liver oil that I had to go to Doctor Nelson for help. And they were such good questions, of so much general interest, that I persuaded him to join us on the Farm and Home Hour today and answer them in person.

First, let me read you the letter, at least part of it, to give you the questions the way they were put up to us:

"Dear Miss Van Deman: I wish you would tell me a little about cod-liver oil and halibut-liver oil. Every bottle, package, and brand has a different unit of vitamins.

"I am giving our boy 7 years old 1/2 teaspoon of cod-liver oil. Each gram contains not less than 1750 USPX (1931) vitamin A units + 231 USPX (1934) vitamin D units (750 ADMA).

"I am giving our girl 13 and myself, halibut-liver oil capsules, two a day. Each capsule contains 9500 International units of vitamin A + 131 International units (425 ADMA) of vitamin D.

"What is the dosage for growing children, age 7 and 13, and for adults, according to these units of vitamins A and D as we find them marked on the packages?

"I hope you can help me with these problems" ... and so on.

Well, Doctor Nelson, where shall we begin?

DOCTOR NELSON: With vitamin units, I guess. That plunges us right into a rather technical subject. To understand vitamin units at all, you have to go back somewhat to their origin.

(over)

I don't wonder that the lady who wrote you was confused by the various numbers and terms she finds on packages. Even so the situation is much better than it was some years back. It came to such a pass then that scientists themselves couldn't understand their own language. So in 1931 vitamin experts from many countries met in London under the auspices of the League of Nations Health Organisation to work out an international system of designating vitamin potency.

MISS VAN DEMAN: A common denominator for the results of vitamin research -

DOCTOR NELSON: Exactly. That conference adopted a system of standards and units which were provisional for two years. In 1934 a second conference on vitamin standardization was held in London. As a result international standards and units for four vitamins - A, B, C, and D - were adopted and are now in use.

MISS VAN DEMAN: On cod-liver oil and other preparations.

DOCTOR NELSON: Yes. Especially with a product like cod-liver oil, which is shipped all over the world, it's a great help to have a universal designation of vitamin potency. We get large quantities of our cod-liver oil from Norway. Over there it always used to be assayed and marked in terms of Oslo units. And here in the United States we've had Sherman units for vitamin A and Steenbock units for vitamin D, and ADMA and USP units for both.

MISS VAN DEMAN: ADMA meaning American Drug Manufacturer's Association?

DOCTOR NELSON: That's right.

MISS VAN DEMAN: And USP, United States Pharmacopoeia?

DOCTOR NELSON: Right.

MISS VAN DEMAN: The U. S. Pharmacopoeia being an official standard for drugs in this country.

DOCTOR NELSON: Yes. That defines it well for our purposes here. And now let me make clear, the USP units and the International units are equal in value. Just for emphasis I'm going to repeat: The USP units and the International units are equal in value. And I'm glad to say they're both coming into more general use, so the confusion is being ironed out. Miss Van Deman, you remember that little bottle of cod-liver oil I showed you the other day?

MISS VAN DEMAN: You mean the one marked "Reference Cod-Liver Oil", I certainly do.

DOCTOR NELSON: That's the legal standard for testing cod-liver oils for vitamin A and vitamin D in this country. One gram of this so-called Reference oil contains 3,000 USP vitamin A units and 95 USP units of vitamin D.

At the International Vitamin Conference held in London, of which we spoke a moment ago, certain substances which could be readily reproduced were adopted as vitamin standards. It was agreed that a certain weight of one standard would contain one unit of vitamin A and a certain weight of another standard would contain one unit of vitamin D. These standards have been prepared and sent to various countries and can be used to prepare other standards such as the USP Reference cod-liver oil.

The international standard for vitamin A is pure beta-carotene, and for vitamin D irradiated ergosterol. But I don't think we need to go into that here.

MISS VAN DEMAN: No. That's carrying vitamins pretty far for us. But I certainly was interested, Doctor Nelson, in that little vial you showed me full of pure vitamin A crystals floating in alcohol. They glinted like bits of golden bronze, as I turned the bottle.

DOCTOR NELSON: Yes, crystals of beta-carotene, vitamin A in a pure form, and they are worth their weight in gold several times over. And so was that pure vitamin D I showed you, in the form of a fine white powder.

MISS VAN DEMAN: But I take it that vitamins in those forms are rather in the nature of scientific curiosities - far removed from vitamins as we consume them every day.

DOCTOR NELSON: Not as far removed as you may suppose, but we do better to get our vitamins as far as possible from the foods on the table.

MISS VAN DEMAN: Well, getting back to our Wyoming friend's letter, have you anything to say about halibut-liver oil?

DOCTOR NELSON: Nothing beyond the fact that it's very, very rich in vitamins A and D. And so are some of the other fish liver oils. There are some 100 times richer than cod-liver oil in both these vitamins.

MISS VAN DEMAN: Now going on to vitamin requirements, how many units of the different vitamins does the human body need each day? Or has that been determined yet?

DOCTOR NELSON: Those are really two questions. But maybe I can answer them both together. By the way, if I don't mention the kind of units, please understand that I mean either USP or International units.

Now we know the infant's requirement for vitamin A and D fairly well, but we don't know so much about the requirements of older children and adults. To prevent rickets, the American Medical Association recommends 2 teaspoons of cod-liver oil daily for bottle-fed infants under 2 years of age. Breast-fed babies need less, of course, exactly how much less depending on the condition of both mother and child. Now since cod-liver oil as sold in this country must contain at least 85 USP units of vitamin D per gram, then these 2 teaspoonfuls will contain 625 units.

MISS VAN DEMAN: So the baby under two years needs 625 units of vitamin D each day from some source.

DOCTOR NELSON: That seems to be the prevailing opinion. For a child more than two years old, we haven't any satisfactory way of measuring the amount of vitamin D he needs. Obviously it is less than when he was an infant, because children more than two years old rarely develop acute cases of rickets. And in this discussion we mustn't overlook the fact that vitamin D is produced in the body by the ultra-violet rays in sunshine acting directly on the skin.

MISS VAN DEMAN: Yes, I know. We can get vitamin D in two ways - through foods and through sun baths. Well, what about the adult - how much vitamin D do we grown-ups need?

DOCTOR NELSON: I wish I could tell you. But we don't know. There are no scientific evidences of extreme vitamin D deficiency among groups of adults. So that leads us to believe that the adult's need for vitamin D is rather low, unless he has fractured a bone or something like that. Then he may need an extra amount of vitamin D to help the bone knit.

MISS VAN DEMAN: What about vitamin A?

DOCTOR NELSON: For a baby under one year of age 1500 units of vitamin A per day is probably enough. That is based on the amount of vitamin A that can be obtained from mothers' milk.

MISS VAN DEMAN: But you would get much more vitamin A than that from two teaspoonfuls of cod-liver oil.

DOCTOR NELSON: Yes. You would get more than 4000 units of vitamin A from 2 teaspoons of cod-liver oil. Cod-liver oil must contain at least 600 USP units of vitamin A per gram.

MISS VAN DEMAN: What about older children and adults?

DOCTOR NELSON: The indications from animal experiments are that there is an increase in daily vitamin A requirement during the growing period until adult weight is reached. Just how much of an increase we don't know, but we have no concrete evidence that man at any age needs more than 4000 units of vitamin A daily.

MISS VAN DEMAN: Can't we easily get that in our food if we eat a well-balanced diet?

DOCTOR NELSON: Yes, certainly. And please remember that you couldn't choose a diet that would contain no vitamin A. And that table food is really the cheapest source of vitamin A.

MISS VAN DEMAN: Yes. As I've mentioned many times before, butter, cream, egg yolk, and yellow and green leafy vegetables are all rich sources of vitamin A.

Well, Doctor Nelson, I'm afraid we haven't answered our Wyoming friend's questions as definitely as she'd like ...

DOCTOR NELSON: Probably not. But we've gone as far as we can with the information we have on vitamin units and human requirements. Of course there will always be a wide latitude of choice on the sources from which you get your vitamins.

MISS VAN DEMAN: Thank you very much, Doctor Nelson, for coming over today. And schedules permitting, I'll be with you again next week, probably on Thursday.